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Abstract: Building from resource-based view, this study developed a model of the dynamic capabilities strategy in an emerging market, especially with a particular focus on the new ventures. We generated hypotheses based on this framework, linking them with new venture performance, with the moderation role of environmental dynamism. We tested our hypotheses on a sample of new ventures in the context of China's Yangtze River Delta Region. Empirical results showed that environmental sensing capability and changing and renewal capability had significant impacts on new venture performance. Additionally, environmental sensing capability, and changing and renewal capability both had a stronger impact on new venture performance at higher levels of environmental dynamism. Implications and future research directions are considered.

Key words: dynamic capabilities strategy; new venture performance; environmental dynamism

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1 Introduction

According to D'Aveni (1994), business has entered a new era of hypercompetition, shifting dramatically from slow-moving stable oligopolies to a complicated and unpredictable environment in which competitive advantage is no longer sustainable over the long haul. Advantage, instead, is continually created, eroded, destroyed and recreated through strategic maneuvering by the new ventures (Griffith and Harvey, 2001). Therefore, new ventures increasingly have a number of reasons to embrace dynamic capabilities theory as a primary strategy: defined as a firm's behavioural orientation to constantly integrate, reconfigure, renew, re-organize and re-create internal and external resources and capabilities and, most importantly, upgrade and reconstruct its operational capabilities in response to dynamic and rapidly shifting market environments to attain and sustain competitive advantage (Teece and Piano, 1994; Teece et al., 1997; Winter, 2003). Such capabilities enable new ventures to adapt to complicated business environments (Teece, 2007). Moreover, Zahra et al. (2006) concluded that dynamic capabilities in new ventures and established companies are different. Boccardelli and Magnusson (2006) also employed the dynamic capabilities perspective in early-phase entrepreneurship. Therefore, dynamic capabilities theory can explain how new ventures create, define, discover, and exploit entrepreneurial opportunities in complex and volatile external environments in searching for strategic matching of resources and market needs.

Many scholars have conducted the research to dynamic capabilities theory from perspectives such as definition, influential factors, and construction mechanism of

dynamic capabilities (Collis, 1994; Zahra and George, 2002; Zollo and Winter, 2002; Daniel and Wilson, 2003; Winter, 2003; Zott, 2003; Teece, 2007; Jiao et al., 2008). Although they believe that dynamic capabilities are positively related to performance, to date, research has not provided a compelling explanation about the effect of environmental dynamism on the relationship between dynamic capabilities and new venture performance. Therefore, the study tries to explore the potential moderation effect on the relationship between dynamic capabilities and new venture performance. According to Baron and Kenny (1986), the study investigates the effect of environmental dynamism on the relationship between dynamic capabilities and new venture performance.

The structure of this paper follows: after the Introduction, Section 2 reviews the literature and develops research hypotheses; Section 3 describes the research methodology; Section 4 discusses the empirical results; and Section 5 concludes the paper and describes implications.

2 Literature review and hypotheses

2.1 Dynamic capabilities strategy and new venture performance

Dynamic capabilities, entailing the development of new operational capabilities, are emerging as an important source of sustainable competitive advantage (Zahra et al., 2006). Through effective dynamic capabilities, business firms will be able to transform information into innovative products, services, and processes, and thus lead to better technical and administrative outcomes. This is evidenced by the significant number of studies of dynamic capabilities (i. e. Lee et al., 2002; Zahra and George, 2002; Zott, 2003; Jantunen et al., 2005; Wu, 2007). For example, Lee et al. (2002) elaborated Schumpeter's concept of creative destruction, believing that dynamic capabilities were the sources of sustainable competitive advantage in competition.

Zahra and George (2002) found that dynamic capabilities influence the nature and sustainability of a firm's competitive advantage. Zott (2003) found dynamic capabilities in new ventures created and shaped their resource position and capabilities, which in turn determine the performance. Jantunen et al. (2005) analyzed the relationship among entrepreneurial orientation, dynamic capabilities and internationalized performance, finding that dynamic capabilities displayed great effects on the international performance. Wu (2007) found that dynamic capabilities were significantly helping to leverage entrepreneurial resources to benefit start-up performance.

Moreover, Zollo and Winter (2002) and Winter (2003) also differentiated operational capabilities from dynamic capabilities, arguing that operational capabilities earn the living at the current stage, while dynamic capabilities reconfigure operational capabilities so as to adapt to the changing environment in the long time. Thus, new ventures rely on environmental sensing capability and rapid response capability so that they may dynamically adapt to complicated environment. Ultimately, new ventures, who achieve the knowledge from environment, configure and integrate operational capabilities through flexibility capabilities, and thereby essentially change internally and effectively respond to new market demands, can realize the dynamic match between internal resources and external environment (Teece, 2007).

The preceding arguments suggest that new ventures can use dynamic capabilities to influence their behavior, and add greater value in developing new capabilities so as to introduce new products, services, and management system in response to the environment to achieve better outcomes. Given the above evidence, we argue that dynamic capabilities are conducive to new venture performance. We, thus, propose

Hypothesis 1. Dynamic capabilities strategy in the entrepreneurial firms will

have a positive relationship with new venture performance.

2.2 The moderating role of environmental dynamism

Environmental dynamism describes the rate and unpredictability of changes in a firm's external environment (Dess and Beard, 1984). When new ventures face highly dynamic environments, operators face vague value-judgment standards and discouraging environments for the selection of operational strategies; these factors may force operators to rapidly make strategic decisions using limited diagnostic observations of the company's operational environments, so as to establish dynamic capabilities. However, the organization and execution of dynamic capabilities strategies will inevitably incur costs due to execution by flexible management. If an organization has to enforce strategies to maintain highly dynamic capabilities within a comparatively stable environment, it may lead to more losses than benefits. Therefore, it is necessary to employ environmental dynamism and explore its effect on dynamic capabilities and new venture performance.

Milliken (1987) considered environmental dynamism as speed of product changes, the changing frequency of customer preference and operational environment. According to Zahra and Covin (1995), business firms under turbulent environments need to continuously renew product/service so as to respond to environmental change. Thus, these businesses will be better able to satisfy customers' continuously changing preferences, making timely and effective responses to competitors' tactics. More dynamic environments require them to maintain higher levels of dynamic capabilities, so as to effectively respond to changes in customer needs as well as technological transformation in order realize higher levels of performance during heightened periods of competition.

In addition, how to strategically match the resources and capabilities to the

environments is fundamental in the strategic management field for years (Andrews, 1972). During this process, environmental dynamism is the variance of important effects. The relevant literature shows that environmental dynamism is characterized by rapidly changing dynamic organizational environments and crisis states. Uncertainties and opportunities may affect and even change the position of an organization in market competition (Sharfman and Dean, 1991).

Moreover, research in the resource-based view of competitive advantage has increasingly recognized that the strategic value of a firm's resource or capabilities depends on the specific market contexts (Miller and Shamsie, 1996; Eisenhardt and Martin, 2000). For example, Miller and Shamsie (1996) found that property-based resources such as exclusive long-term contracts with star actors improved financial performance in a predictable environment, while knowledge-based capabilities such as the production and coordinative process boosted financial performance in a changing and unpredictable environment.

Facing rapid changes in technologies, markets, and competition, new ventures rely more on the fast response capabilities to cope with the changing external conditions and thereby survive and prosper in the new environment. It is the dynamic capabilities strategy that helps new ventures to obtain real-time information about their businesses and environments, which affects the speed of strategic decision making and thus new venture performance in a high velocity environment. Hence, the greater demands that the dynamic external environment places suggest that new ventures would benefit more from dynamic capabilities strategy for fast response to customer's needs in a changing business climate than in a stable environment. Therefore, we propose

Hypothesis 2. The interaction between dynamic capabilities strategy in the

entrepreneurial firms and environmental dynamism is positively related to new venture performance.

Insert Figure 1 here

3 Research Methodology

3.1 Research settings and design

We chose China as representative emerging economies. The country provides a rich context to study the moderation effect of environmental dynamism in the relationship between dynamic capabilities strategy and new venture performance. China has a larger economy, which is liberalizing at a measured pace, and enjoys a mix of low, medium and high technology firms. We opted to collect data for this study through a survey instrument, because secondary data for focal variables were unavailable. Our survey instrument had questions, using Likert scales, about firm characteristics, dynamic capabilities strategy, environmental dynamism, and new venture performance. New ventures in the context of China's Yangtze River Delta Region such as in Shanghai, Hangzhou, Nanjing, Wuxi, and Ningbo responded to our survey. All these cities are relatively entrepreneurial centers in China. Collected data was analyzed with VisualPLS1.04b software packages, mainly, using analytical methods such as factor analysis and structural equation model, e.g.

3.2 Data collection and sample

There are significant obstacles in data collection in emerging economies (Hoskisson et al., 2000). Comprehensive and current lists of firms are unavailable. Many firms are hesitant to share any data, especially information pertaining to financial performance and firm size because of widespread tax evasion. In these circumstances, personal interviews of managers and sending questionnaire to managers in personal network are suitable means for data collection. Personal

interviewing ensures access to correct respondents, facilitates accuracy in interpretation of the survey instrument, and improves data quality (Slater and Kwaku, 2004).

We set two criteria for new ventures that were included in the sample for this study. First, new ventures must establish more than one year. We selected new ventures that had been in operation for more than one year and less than eight years (Quinn and Cameron, 1983; Sandberg and Hofer, 1987; Ostgaard and Birley, 1996; Chrisman et al, 1999). Because the new ventures are capable of being gradually led onto correct paths and their dynamic capabilities can be gradually formed only after they have passed through their transitional periods. Second, we chose independent companies other than branch factories or subsidiary companies under headquarter companies, including sales and distribution, R&D or production departments, mostly in the form of high technology.

A total of 350 copies of the questionnaires were distributed, mainly to the upper level managers in entrepreneurial firms. The questionnaires were also distributed to entrepreneurs through personal networks using a scrolling method. When we were distributing questionnaires, we requested respondents to answer questions anonymously. Last, the variety of respondents and the diversity of the venues within this they worked ensured that system errors during data collection were effectively reduced, assuring data reliability and validity. In total, 180 questionnaires were collected, in which 65 questionnaires are not completed. Therefore, 115 copies of questionnaire were considered effective.

Due to the collection of all measures from the same source, this study uses the Harman one-factor test to examine the potential problem of common method variance. Significant common method variance would result if one general factor accounts for

the majority of covariance in the variables (Podsakoff and Organ, 1986). A principal factor analysis on the questionnaire measurement items of this study yields the first factor, accounting for 25.95% for the variance. Since one general factor does not account for most of the variance, common method bias is unlikely to be a serious problem in the data.

3.3 Measures

We developed scales and items based upon the conceptual domain of our focal constructs. First, we conceptually defined each construct. Second, we developed items that would serve as indicators of that domain. Concurrently, we reviewed relevant literature and initially identified a pool of items for each construct. Third, to assist in the preparation of the questionnaire, we validated the content through a series of interviews with experts on its different sections. Their suggestions and contributions were incorporated into a second version of the questionnaire. Fourth, these items were reduced in number through correlational analysis of a subset of the data from initially completed survey instruments. Fifth, we conducted exploratory factor analyses to identify items that loaded on each construct and then verified that these items corresponded with the conceptual definition of the construct. Finally, we calculated reliabilities for each scale.

3.3.1 Dynamic capabilities

This study's measurement of dynamic capabilities conforms to the definition of dynamic capabilities strategy by Teece and Pisano (1994), then refined by Teece et. al (1997), Eisenhardt and Martin (2000), Lawson and Samson (2001), Jantunen, et al. (2005), Zahra, et al. (2006), Cepeda and Vera (2007) and Jiao et al. (2008). Accordingly, the study adopts four dimensions, including environmental sensing capability, changing and renewal capability, technological flexibility capability,

organizational flexibility capability, in the construct of dynamic capabilities in new ventures, which respectively mean the capabilities to sensitively identify and respond to changes in their industry, the capabilities to innovate and change, the flexibility of technology, and the flexibility of the organization structure. The entrepreneurs and senior managers are asked to recall the strategy circumstances during the operation of the firm in a free response; then questions based on semantic differential scales are employed to provide additional assessments.

The item of employee creativity is deleted from the scale, because its loading is less than 0.400. Reliability for this scale was measured using coefficient alpha (a = 0.870). Principal component analysis revealed four factors with the eigenvalues of 5.289, 1.598, 1.419 and 1.280 respectively, accounting for 68.477 percent of the variance and having factor loadings ranging from 0.560 to 0.867.

3.3.2 Environmental dynamism

The measurement on environmental dynamism included six measurement items, with reference to research by Aldrich (1979), Dess and Beard (1984) and Milliken (1987), which was measured through the product/service features desired by your customers, the product/service features offered by your competitors, the customer's preference of your company, the product/process technologies in your industry, the operational environment of your company, the government policy in your industry. Reliability for this construct was 0.868 and a principal component analysis of items associated with this scale showed a single factor with an eigenvalue of 3.621 which accounted for 60.355 percent of the variance. Factor loadings on this component ranged from 0.726 to 0.838.

3.3.3 New venture performance

New venture performance reflects fulfillment of given targets (Ostgaard and

Birley, 1996). It is meaningful to examine the impact of dynamic capabilities on long-term performance, which can be measured by the firm's key (both market and financial) performance indicators in comparison with its main competitors over a long period. According to Chrisman et al. (1999), new venture performance was measured from growth ratio of sale revenues, pre-tax profits, and market shares, compared to the competitors over a period of five years. Reliability for this scale was 0.875. A principal component analysis of these four items yielded a single factor that had an eigenvalue of 2.401 that accounted for 80.026 per cent of the variance. Factor loadings for items for this scale ranged from 0.878 to 0.911.

4 Results and discussions

According to Fornell and Cha (1994), the chosen method for analyzing the data has been the analysis of structural equations using the Partial Least Squares (PLS) technique. This methodology, which uses the Ordinary Least Squares (OLS) algorithm, is designed to reflect the theoretical and empirical qualities of social sciences and behavior, where there are usually situations with insufficiently supported theories and little information available (Wold, 1979). This study uses Visual PLS software version 1.04b. Ultimately, in order to ensure effective validation of hypotheses, it is necessary to conduct prior tests on the reliability and effectiveness of measurement models.

Using PLS involves following a two-stage or step approach (Barclay, Higgins, and Thompson, 1995). The first step requires the assessment of the measurement model. This allows the relationships between the observable variables and theoretical concepts to be specified. This analysis is performed in relation to the attributes of individual item reliability, construct reliability, average variance extracted (AVE), and discriminant validity of the indicators as measures of latent variables. For the second step, the structural model is evaluated. The objective of this is to confirm to what

extent the causal relationships specified by the proposed model are consistent with the available data.

To analyze the relationships between the different constructs and their indicators, we have adopted the latent model perspective, in which the latent variable is understood to be the cause of the indicators and, therefore, we speak of reflective indicators. The environmental dynamism and new venture performance constructs present a first order factor in which the set of items come together in a single principal factor. However, dynamic capabilities strategy, one of the three constructs in the model, is operationalized using a molecular approximation whereby the second order factors are the cause of their first order components or factors (Chin and Gopal, 1995), it being necessary to apply the approximation in two steps, also known as a hierarchical components model (Lohmoller, 1989).

With regards to the measurement model, we began assessing the individual item reliability (Table 1). Generally speaking for all measurement specifications, standardized factor loading should exceed the accepted threshold of .707 (Carmines and Zeller, 1979; Shimp and Sharma, 1987; Hulland, 1999). However, various researchers believe that this rule of thumb should not be so inflexible and such a limit may be appropriately enlarged, and 0.650 may be taken as minimum standard (Barclay et al., 1995; Chin, 1998). Results show that the minimum loading of standardized factor in measurement specifications is at 0.659, higher than 0.650, the minimum requirement, exhibits higher statistic prominence ($P<0.005$), which shows extremely convergent validity of the constructs in our study.

From an examination of the results shown in the Table 1, we can state that all of the constructs are reliable as they present values for composite reliability greater than the value of 0.700 required in the early stages of research, and the stricter value of

0.800 for basic research (Nunnally, 1978).

Meanwhile, The Average Variance Extracted (AVE) of each latent construct should be greater than 0.500 meaning that 50% or more variance of the indicators should be accounted for (Fornell and Larcker, 1981). All constructs of our model exceed this condition (Table 2).

In addition to the convergent validity of the constructs in our study, the constructs also exhibit relatively high discriminant validity. For discriminant validity, we have compared the square root of the AVE (i.e., the diagonals in Table 2) with the correlations among constructs (i.e., the off-diagonal elements in Table 2). According to research by Fornell and Larcker (1981), in order to ensure that various constructs differ in connotation and cases, the AVE square root of each construct in the models shall be higher than the relevant coefficient between such a construct and other constructs. On average, each construct relates more strongly to its own measures than to others, providing an estimate of discriminant validity of the constructs in our study.

Insert Tables 1 and 2 here

The structural model resulting from the PLS analysis is summarized in Table 3, where the standardized path coefficients (β) and the t-value observed with the level of significance achieved from the bootstrap test are shown. As is observed, some of the hypotheses presented have been verified.

Since PLS makes no distributional assumptions in its parameter estimation, traditional parameter-based techniques for significance testing and model evaluation are considered to be inappropriate (Chin, 1998). One consequence of the comparison between covariance structure analysis modeling approaches and PLS is that no proper overall goodness-of-fit measures exist for models using the latter (Hulland, 1999). The structural model is evaluated examining the R^2 values and the size of the

structural path coefficients. Finally, the stability of the estimates is examined by using the t-statistics obtained from a bootstrap test with 500 resamples. Table 3 sets out the path coefficients and the t values observed with the level of significance achieved from the bootstrap test.

Insert Table 3 here

By first validating the relationship between dynamic capabilities strategy and new venture performance, the explained variance is at 0.106. With respect to the relationship of dynamic capabilities strategy and the consequent variable of the model, in accordance with hypothesis H1, the influence of dynamic capabilities strategy on new venture performance has been fully confirmed (β= 0.326, P<0.001).

Moreover, environmental sensing capability was positively and significantly associated with the new venture performance (β= 0.118, P<0.05). The path coefficient of new venture performance on changing and renewal capability was positive and statistically significant (β= 0.180, P<0.05). The effect of the changing and renewal capability on new venture performance lies in configuration and integration of entire value chain in the entrepreneurial firms so as to change operational capability to adapt dynamic environment (Eisenhardt and Martin, 2000). The positive effects of technological flexibility capability and organizational flexibility capability on new venture performance were not significant. It is possibly because flexibility capabilities do not cause effects on performance over short periods. Thus, the effect of flexibility capabilities on new venture performance was not significant in the research.

Therefore, our analyses showed that changing and renewal capability has the strongest impact on new venture performance, followed by environmental sensing capability. It may be that sensitiveness of new ventures into external environments needs to be developed by entrepreneurs, who obtain the knowledge and resources

through social networks or enterprise's information system, and further spread within new ventures, so as to realize the positive effect of environmental sensing capability. Changing and renewal capability leads to greater impact on new venture performance for creating new operating capability.

Insert Table 4 here

Our second hypothesis stated that an interaction between dynamic capabilities strategy and environmental dynamism would be positively associated with new venture performance. According to Chin (1998), a self extension and replacement sampling method was adopted, and 500 resamples were based for calculation of standard errors. As flexibility capabilities are not significantly related to new venture performance, only environmental sensing capability, changing and renewal capability and environmental dynamism were included into the structural equation model. Then the interaction terms between environmental sensing capability, changing and renewal capability and environmental dynamism were included in the model for analysis.

The coefficient for the interaction term between environmental sensing capability and environmental dynamism was positive and statistically significant (β= 0.219, P<0.01). The coefficient for the interaction term between changing and renewal capability and environmental dynamism was positive and statistically significant (β= 0.240, P<0.01). According to Tabachnick and Fidell (1996), the change in R^2 was also significant ($p < 0.05$). An interesting aspect of this result was that the term for environmental dynamism was negatively and significantly associated with new venture performance (β=-0.180, P<0.01). However, once the interaction terms entered the model, its coefficient was positive and statistically significant. This result showed support for our rationale that environmental dynamism without environmental sensing capability or changing and renewal capability have minimal, and in this case, negative

effects on new venture performance.

Insert Figure 2 here

This interaction effect has been plotted in Figure 2. We split the total sample into subgroups on the basis of median of the hypothesized moderator variable, environmental dynamism. As illustrated in Figure 2, the relationship between capabilities and new venture performance is stronger (has a steeper positive slope) at higher levels of environmental dynamism. Because in Table 4, the coefficient of new venture performance on environmental sensing capability is 0.215, i.e. for each unit increase in environmental sensing capability, new venture performance increases by 0.215. However, at higher levels of environmental dynamism (above the median), this slope increases to 0.355. Thus the effect of environmental sensing capability on new venture performance increases in the turbulent environment. At low levels of environmental dynamism (below the median), the slope of the regression of new venture performance on environmental sensing capability falls to 0.135. This supports our assertion that at higher levels of environmental dynamism, environmental sensing capability has a stronger impact on new venture performance.

Similarly, the coefficient of new venture performance on changing and renewal capability is 0.129, i.e. for each unit increase in changing and renewal capability, new venture performance increases by 0.129. However, at higher levels of environmental dynamism (above the median), this slope increases to 0.312. Thus the effect of changing and renewal capability on new venture performance increases in the turbulent environment. At low levels of environmental dynamism (below the median), the slope of the regression of new venture performance on changing and renewal capability falls to 0.183. This supports our assertion that at higher levels of environmental dynamism, changing and renewal capability have a stronger impact on

new venture performance.

5 Conclusions

This study is one of the first steps in developing and testing the dynamic capabilities perspective for new ventures in emerging market. In this regard, we developed and tested a conceptual framework of dynamic capabilities strategy and their association with new venture performance. We also modeled and tested the role of environmental dynamism new venture faces. Empirical results reveal that environmental sensing capability and changing and renewal capability were positively and significantly associated with the new venture performance in the higher turbulent environments. That is to say, dynamic capabilities strategy in the new ventures is more likely to lead to better performance under greater environmental dynamism, which verifies our hypothesis that environmental dynamism moderates the relationship between dynamic capabilities strategy and new venture performance.

One central contribution of our study is the identification, conceptualization and empirical validation of dynamic capabilities in the new ventures in the context of an emerging market, China. Specifically, constructing environmental sensing capability, changing and renewal capability, organizational flexibility capability, and technological flexibility capability contribute towards enhanced new venture performance. These findings are supportive of earlier assertions that entrepreneurial companies have the distinctive capabilities to create, define, discover, and exploit opportunities ahead of their rivals (Zahra, 2006).

Another central contribution of our study is that we elucidate the dynamic capabilities and performance in a rapidly evolving environment, especially with a particular focus on the new ventures in an emerging market, China. Although the evidence supports the dynamic capabilities have the positive impact on the

organization (i.e. Zahra and George, 2002), it is rare that verify the relationship focusing on the new ventures in an emerging market. The study provides a better understanding of under what circumstances and how new ventures should allocate their resources and capabilities in search of sustainable competitive advantage.

Therefore, dynamic capabilities theory shows that the long-term competitive advantage of new ventures originates from their capabilities to create, accumulate, and utilize fundamental operational capabilities under turbulent, complicated, and ever-changing environments. Such dynamic environments require that new ventures possess not only operational capability but also dynamic capabilities to continuously upgrade their operational capability (Teece et al., 1997). Moreover, new ventures have to strategically match their resources and capabilities to the environment they face, so as to adapt to their environment and ultimately obtaining an economic rent greater than the average profit in their industry. These conclusions provide new ventures with theoretical direction and practical guidance to establish sustainable competitive advantage under complicated environments.

This study also contributes the relatively static perspective of the resource-based view (Barney, 1991) and the paradox of core capability and core rigidity, which causes inertia and resistance to change because of the path dependence (Burgleman, 1983, 1991; Barton, 1992).These contributions enrich capabilities-related research in strategic management field, and provide a foundation for future explorations on the relationships between dynamic capabilities and other variances. To some extent, the study enriches relevant research in strategic management fields, and provides evidence to answer the two fundamental economics questions in strategy management field, why can business firms make profit and why can some business firms, compared with their competitors, obtain an economic rent greater than the average

profit in their industries (Penrose, 1959; Porter, 1985, 1991)? This research employed research framework based on dynamic capabilities strategy–environmental dynamism–new venture performance and finally provided feasible solutions for new ventures to formulate dynamic capabilities strategy to adapt changing environment.

This study also had some limitations. Our data were self-reported of entrepreneurs and senior managers. Although we used personal interview to reduce informant bias, such sources of bias cannot be ruled out as a possibility. Moreover, our sample size was relatively small. In the future, we should introduce bigger sample size to verify the conception framework.

Despite the limitations of our study, the study has developed and tested the conceptual model in an emerging market. This research has practical implications for entrepreneurs and senior managers in the new ventures, who can gain from our results by identifying and training dynamic capabilities, and benchmarking them with industry peers, thereby leading to better adaptation to transformation introduced by environmental dynamism.

Further studies can be extended in the following directions. First, future research can theoretically extend our model by introducing firm variables such as organizational learning, entrepreneurial orientation and innovativeness, which are the antecedent to the dynamic capabilities of new ventures in emerging economy contexts. Furthermore, it is likely that new ventures in different industries have different dynamic capabilities. This is also a subject that is worthy of further investigation. Subsequent research may be dedicated to the specific industries, so that we can compare between different industries and find out the effects of industry on the relationship among dynamic capabilities strategy, environmental dynamism, and new venture performance.

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Table 1 Individual item reliability and composite reliability

Concept (latent variance) and measurement items	Factor loading	T value	Composite reliability coefficient
Environmental sensing capability			
• Deep understanding in the operational rule in our industry.	0.860	30.331	
• Sufficient recognition on change trends and establishment plans for quick response.	0.811	27.129	0.861
• Frequent communications with stakeholders such as competitors, customers, suppliers, etc for timely collection of useful information from them.	0.789	20.846	
Changing and renewal capability			
• Sufficient supports by our company for employee innovation activities.	0.809	21.693	
• Encouragement for innovative culture.	0.821	25.836	0.850
• Sufficient stimulations and awards to employees of innovation capabilities.	0.769	18.685	
• Adventuring and initiating spirits of employees at our company.	0.659	11.647	
Technological flexibility capability			
• Technology in our company is favorable for increasing product/ service.	0.800	23.851	
• Technology in our company is applicable in many kinds of products/service.	0.860	28.036	0.876
• Technology in our company is favorable for elevating customer's sense of recognition on product/service.	0.852	34.742	
Organizational flexibility capability			
• Various departments allowed by our company to break through formal working procedures so as to maintain working flexibility and dynamism.	0.788	19.108	
• Working modes operated internally at our company different from person to person, for making proper policies from time to time.	0.811	21.983	0.887
• Smooth internal communication channels and mechanisms in our company.	0.837	31.355	
• Our company always faster than competitors in realizing opportunities.	0.817	25.025	
New venture performance			
• sales performance	0.894	57.852	0.923
• pre-tax profits	0.911	68.909	
• market shares	0.878	26.631	
Environmental dynamism			
• the product/service features desired by your customers	0.747	15.087	
• the product/service features offered by your competitors	0.759	23.889	
• the customer's preference of your company	0.808	26.889	0.901
• the product/process technologies in your industry	0.838	32.466	
• the operational environment of your company	0.726	14.460	
• the government policy in your industry	0.779	25.099	

Table 2 Averages, typical deviations and construct correlations

Constructs	Mean	SD	1	2	3	4	5	6
1 Environmental sensing capability	4.003	0.659	**0.673**					
2 Changing and renewal capability	3.698	0.678	0.389	**0.588**				
3 Technological flexibility capability	3.834	0.694	0.390	0.451	**0.701**			
4 Organizational flexibility capability	3.339	0.869	0.351	0.519	0.450	**0.661**		
5 New venture performance	3.075	1.087	0.231	0.245	0.216	0.200	**0.800**	
6 Environmental dynamism	2.810	0.871	0.035	-0.145	-0.065	0.074	-0.137	**0.603**

Note: [a]Diagonal elements (bold figures) are the square root of the variance shared between the constructs and their measures. Off-diagonal elements are the correlations among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal.

[b]All of the correlations are significant at the p <.01 level.

Table 3 Empirical results: new venture performances on dynamic capabilities strategy

Variables	New venture performance	
	Path coefficients	T value
Dynamic capabilities strategy	0.326***	5.115
Environmental sensing capability	0.118*	1.452
Changing and renewal capability	0.180*	1.598
Technological flexibility capability	0.057	0.810
Organizational flexibility capability	0.069	0.805

*Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

Table 4 PLS-based SEM analysis results: Primary effect and moderation effect

Exogenous Variables	New Venture Performance	
	First stage	Second stage
Environmental sensing capability	0.150 (1.770) *	0.215 (2.392) **
Changing and renewal capability	0.209 (2.755) **	0.129 (1.474) *
Environmental dynamism	-0.144 (-2.146) **	-0.180(-2.430) **
Environmental sensing capability × Environmental dynamism		0.219 (2.244) **
Changing and renewal capability × Environmental dynamism·		0.240 (1.975) **
R^2	0.123	0.243
Change in R^2	0.120	

*Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

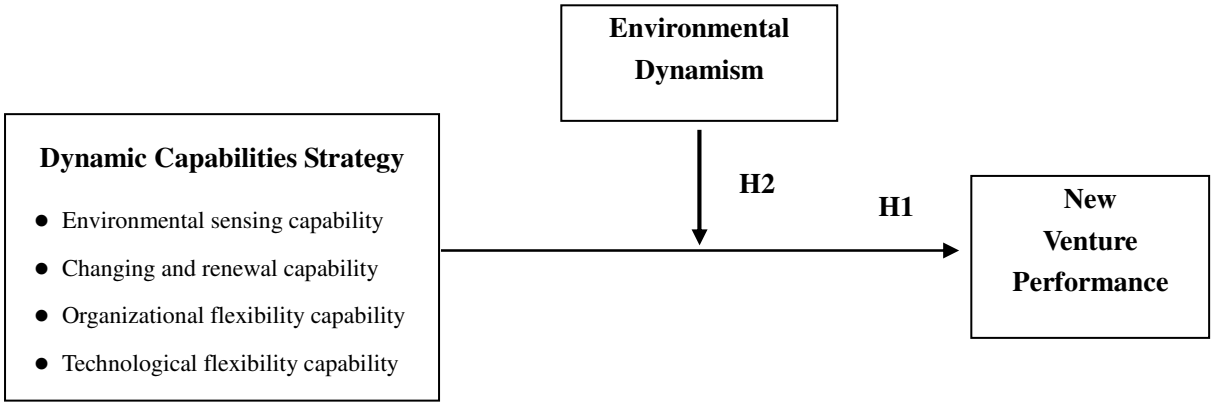

Figure 1 Conceptual model and hypothesized relationships

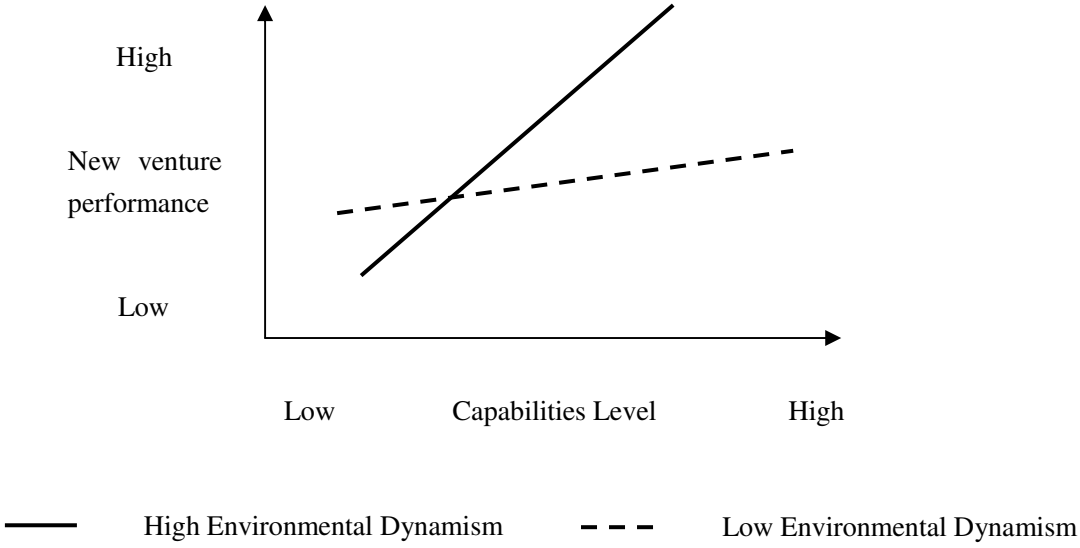

Figure 2 Interaction between dynamic capabilities strategy and environmental dynamism